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EXAMINER
MORRISON, JAY A

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>11 February 2004</u>.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-38</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-38</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>11 February 2004</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   Claims 1-38 are pending.

Claim Objections

2.   Claim 25 is objected to because of the following informalities:

   a.   As per claim 1, line 6: "selected entry" should be "the selected entry".

   b.   As per claim 16, line 1: "first data set" should be "the first data set".

   c.   As per claim 16, line 1: "second data set" should be "the second data set."

   d.   As per claim 25, line 2: "has table" should be "hash table".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

3.   Claims 17,19,22-24,37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 17 recites the limitation "each entry" in line 3. There is insufficient antecedent basis for this limitation in the claim. For purposes of examination it will be assumed the Applicant meant "each entry in the first data set".

Claim 19 recites the limitation "the first data set" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 19 recites the limitation "the second data set" in line 4. There is insufficient antecedent basis for this limitation in the claim.

Claim 22 recites the limitation "the hash table" in lines 6,7,8,12,14, and 14-15, but there are two hash tables, introduced in lines 4 and 10, and it is unclear which hash table is being referenced; the iteration in line 16 further confuses the matter.

Claim 23 recites the limitation "the hash table" in line 2, but are two hash tables introduced in claim 22 and it is unclear which hash table is being referenced.

Claim 23 twice recites the limitation "the selected entry" in line 3. There is insufficient antecedent basis for these limitations in the claim. For purposes of examination it will be assumed that the applicant meant "the selected entry from the first data set", respectively.

Claim 23 twice recites the limitation "the selected entry" in line 3. There is insufficient antecedent basis for these limitations in the claim. For purposes of examination it will be assumed that the applicant meant "the selected entry from the first data set", respectively.

Claim 24 recites the limitation "the hash table" in line 2, but there are two hash tables introduced in claim 22 and it is unclear which hash table is being referenced.

Claim 24 twice recites the limitation "the selected entry" in line 3. There is insufficient antecedent basis for these limitations in the claim. For purposes of

examination it will be assumed that the applicant meant "the selected entry from the

second data set", respectively.

Claim 37 recites the limitation "the hash table" in lines 8-9, but there are two hash

tables, introduced in lines 7 and 7-8, and it is unclear which hash table is being

referenced.

Claim Rejections - 35 USC § 101

4.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
> matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
> conditions and requirements of this title.

5.   Claims 1-18,20-38 are rejected under 35 U.S.C. 101 because the claimed

invention is directed to non-statutory subject matter.

Claims 1-18,20-38 rejected under 35 U.S.C. 101 because the claimed invention

is directed to non-statutory subject matter. The claims do not recite a practical

application by producing a physical transformation or producing a useful, concrete, and

tangible result. To perform a physical transformation, the claimed invention must

transform an article or physical object into a different state or thing. Transformation of

data is not a physical transformation. A useful, concrete, and tangible result must be

either specifically recited in the claim or flow inherently therefrom. To be useful the

claimed invention must establish a specific, substantial, and credible utility. To be

concrete the claimed invention must be able to produce the same results given the

same initial starting conditions. To be tangible the claimed invention must produce a

practical application or real world result. In this case the claims fail to perform a physical

transformation because the claims are directed to operating on data. The claims are

useful and concrete, but they fail to product a tangible result because neither the

method or a result is stored to a non-volatile storage nor is any real-world result

reported, for example to a user.

As per claims 17-18,32,35-38, these claims disclose a system but do not

describe any hardware, which is required for a system claim to be statutory.

Accordingly, these system claims are further rejected as non-statutory for failing to

disclose any hardware.

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of

the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g)

prior art under 35 U.S.C. 103(a).

7.   Claims 1-3,5-6,9,17,19-26 are rejected under 35 U.S.C. 103(a) as being

unpatentable over <u>Dada</u> (Publication Number 2004/0093347 A1).

        As per claim 1, <u>Dada</u> teaches

        A method for comparing a first order-independent data set comprising unique

elements with a second order-independent data set comprising unique elements, the

method comprising the steps of: (see abstract)

        · (a) for each entry in the first data set, placing the entry in a hash table;

(paragraph [0022])

        (b) selecting an entry from the second data set; (paragraph [0023])

        (c) looking up selected entry in the hash table; (paragraph [0025])

        (d) removing, in response to locating the selected entry in the hash table, the

selected entry from the hash table; (paragraph [0025])

        (e) determining if additional data set entries exist; and (paragraph [0025])

        (f) looping to step (b) in response to identifying additional second data set

entries. (paragraph [0022]-[0023])

        <u>Dada</u> discloses the claimed invention except for storing the hash values in the

same hash table. It would have been obvious to one having ordinary skill in the art at

the time the invention was made to combine the two hash tables, since it has been held

that omission of an element and its function in a combination where the remaining

elements perform the same functions as before involves only routine skill in the art. *In re Karlson, 136 USPQ 184.*

As per claim 2, <u>Dada</u> teaches

the step of identifying, in response to not locating the selected entry in the hash table, that the selected entry is second data set unique. (paragraph [0026])

As per claim 3, <u>Dada</u> teaches

the step of performing, in response to not locating the selected entry in the hash table, a remedial function. (paragraph [0027])

As per claim 5, <u>Dada</u> teaches

the step of identifying in response to no additional entries existing, any remaining entries in the hash table data ms being first data set unique. (paragraph [0026])

As per claim 6, <u>Dada</u> teaches

the step of performing in response to no additional entries existing, a remedial function. (paragraph [0027])

As per claim 9, <u>Dada</u> teaches

the step of removing the selected entry from the hash table occurs in response to

identifying a match between a selected entry of the first data set and an entry of the

second data set. (paragraph [0025])

As per claim 17,

This claim is rejected on grounds corresponding to the arguments given above

for rejected claim 1 and is similarly rejected.

As per claim 19,

This claim is rejected on grounds corresponding to the arguments given above

for rejected claim 1 and is similarly rejected.

As per claim 20, Dada teaches

A method for comparing a first data set with a second data set, the method

comprising the steps of: (see abstract)

creating a hash table of entries of the first data set; (paragraph [0022])

locating, for each entry in the second data set, an entry in the hash table;

(paragraph [0025])

and removing, in response to locating an entry in the hash table, the located

entry. (paragraph [0025])

Dada discloses the claimed invention except for storing the hash values in the

same hash table. It would have been obvious to one having ordinary skill in the art at

the time the invention was made to combine the two hash tables, since it has been held

that omission of an element and its function in a combination where the remaining

elements perform the same functions as before involves only routine skill in the art. *In re*

Karlson, 136 USPQ 184.

As per claim 21, <u>Dada</u> teaches

the step of recording, in response to not locating an entry in the hash table, that

the entry in the second data set is second date set unique. (paragraph [0026])

As per claim 22, <u>Dada</u> teaches

A method for comparing a first data set with a second data set, the method

comprising the steps of:

(a) selecting an entry from the first data set; (paragraph [0022])

(b) determining if the selected entry from the first data set is in a hash table;

(paragraph [0025])

(c) adding, in response to determining that the selected entry from the first data

set is not in the hash table, the selected entry from the first data set to the hash table;

(paragraph [0025])

(d) removing from the hash table, in response to determining that the selected

entry from the first data set is in the hash table, the selected entry from the first data set;

(paragraph [0025])

(e) selecting an entry from the second data set; (paragraph [0023])

(f) determining if the selected entry from the second data set is in a hash table; (paragraph [0025])

(g) adding, in response to determining that the selected entry from the second data set is not in the hash table, the selected entry from the second data set to the hash table; (paragraph [0025])

(h) removing, in response to determining that the selected entry from the second data set is in the hash table, the selected entry from the second data set from the hash table; (paragraph [0025])

and (i) independently continuing steps (a) through (d) and (e) through (h) for all entries in the first and second data sets until both the first and second data sets have been completely processed. (paragraphs [0025])

Dada discloses the claimed invention except for storing the hash values in the same hash table. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the two hash tables, since it has been held that omission of an element and its function in a combination where the remaining elements perform the same functions as before involves only routine skill in the art. *In re Karlson, 136 USPQ 184.*

As per claim 23, Dada teaches

the step of adding the selected entry from the first data set to the hash table further comprises the step of including information with the selected entry identifying the selected entry as originating from the first data set. (paragraph [0026])

As per claim 24, Dada teaches

the step of adding the selected entry from the second data set to the hash table further comprises the step of including information with the selected entry identifying the selected entry as originating from the second data set. (paragraph [0026])

As per claim 25,

the step of removing the selected entry from the second data set from the hash table occurs in response to identifying a match between a selected entry from the second data set and an entry from the first data set. (paragraph [0026])

As per claim 26, Dada teaches

the step of:

(j) recording all entries remaining in the hash table as being unique to either the first data set or the second data set. (paragraph [0026])

8.   Claims 4,7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dada (Publication Number 2004/0093347 A1) as applied to claim 1 above, and further in view of Carteau (Patent Number 6,606,694).

As per claim 4,

Dada does not explicitly indicate "the remedial function comprises deleting the selected entry of the second data set."

However, Carteau discloses "the remedial function comprises deleting the selected entry of the second data set" (column 6, lines 20-29).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Dada and Carteau because using the steps of "the remedial function comprises deleting the selected entry of the second data set" would have given those skilled in the art the tools to improve the invention by mirroring disks without negatively impacting performance during backup. This gives the user the advantage of having the system available during backup.

As per claim 7,

Dada does not explicitly indicate "the remedial function comprises deleting the selected entry of the first data set."

However, Carteau discloses "the remedial function comprises deleting the selected entry of the first data set" (column 6, lines 20-29).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Dada and Carteau because using the steps of "the remedial function comprises deleting the selected entry of the first data set" would have given those skilled in the art the tools to improve the invention by mirroring disks without negatively impacting performance during backup. This gives the user the advantage of having the system available during backup.

As per claim 8,

Dada does not explicitly indicate "the remedial function comprises the step of transferring the selected entry from the first data set to the second data set".

However, Carteau discloses "the remedial function comprises the step of transferring the selected entry from the first data set to the second data set" (column 6, lines 20-29)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Dada and Carteau because using the steps of "the remedial function comprises the step of transferring the selected entry from the first data set to the second data set" would have given those skilled in the art the tools to improve the invention by mirroring disks without negatively impacting performance during backup. This gives the user the advantage of having the system available during backup.

9.   Claims 10-11,18,27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dada (Publication Number 2004/0093347 A1) as applied to claims 1 and 22 above, respectively, and further in view of Aiken (Patent Number 6,240,409).

As per claim 10,

Dada does not explicitly indicate "the hash table comprises a B-tree."

However, Aiken discloses "the hash table comprises a B-tree" (column 13, lines 30-44).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Dada and Aiken because using the steps of "the hash table comprises a B-tree" would have given those skilled in the art the tools to improve the invention by enabling quick evaluation. This gives the user the advantage of not having to wait for results.

As per claim 11,

Dada does not explicitly indicate "the hash table comprises a fast lookup data structure."

. However, Aiken discloses "the hash table comprises a fast lookup data structure" (column 13, lines 30-44).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Dada and Aiken because using the steps of "the hash table comprises a fast lookup data structure" would have given those skilled in the art the tools to improve the invention by enabling quick evaluation. This gives the user the advantage of not having to wait for results.

As per claim 18,

This claim is rejected on grounds corresponding to the arguments given above for rejected claim 10 and is similarly rejected.

As per claim 27-28,

These claims are rejected on grounds corresponding to the arguments given

above for rejected claims 10-11 and are similarly rejected.

Claims 12-16,29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Dada (Publication Number 2004/0093347 A1) as applied to claim 1 and 22 above,

respectively, and further in view of Bailey et al. ('Bailey' hereinafter) (Patent Number

6,473,767).

As per claim 12, Dada teaches

the first data set comprises a set of ... entries on a source system.

Dada does not explicitly indicate "directory".

However, Bailey discloses "directory" (column 3, lines 6-27).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to combine Dada and Bailey because using the steps of "directory"

would have given those skilled in the art the tools to improve the invention by detect

parts of a file system that are added or missing. This gives the user the advantage of

having up to date backup information.

As per claim 13, Dada teaches

the second data set comprises a set of entries of a ... on a destination system.

Dada does not explicitly indicate "directory".

However, Bailey discloses "directory" (column 3, lines 6-27).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Dada and Bailey because using the steps of "directory" would have given those skilled in the art the tools to improve the invention by detect parts of a file system that are added or missing. This gives the user the advantage of having up to date backup information.

As per claim 14, Dada teaches

the first data set comprises a set of ... entries on a destination system.

Dada does not explicitly indicate "directory".

However, Bailey discloses "directory" (column 3, lines 6-27).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Dada and Bailey because using the steps of "directory" would have given those skilled in the art the tools to improve the invention by detect parts of a file system that are added or missing. This gives the user the advantage of having up to date backup information.

As per claim 15 Dada teaches

the second data set comprises ... entries on a source data set.

Dada does not explicitly indicate "directory".

However, Bailey discloses "directory" (column 3, lines 6-27).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Dada and Bailey because using the steps of "directory" would have given those skilled in the art the tools to improve the invention by detect parts of a file system that are added or missing. This gives the user the advantage of having up to date backup information.

As per claim 16, Dada teaches

Dada does not explicitly indicate "first data set and second data set are on different storage devices."

However, Bailey discloses "first data set and second data set are on different storage devices" (column 1, lines 23-31).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Dada and Bailey because using the steps of "first data set and second data set are on different storage devices" would have given those skilled in the art the tools to improve the invention by detect parts of a file system that are added or missing. This gives the user the advantage of having up to date backup information.

As per claim 29-30,

These claims are rejected on grounds corresponding to the arguments given above for rejected claims 12-13 and are similarly rejected.

As per claim 31,

This claim is rejected on grounds corresponding to the arguments given above

for rejected claim 16 and is similarly rejected.

10.   Claims 32-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Dada (Publication Number 2004/0093347 A1) in view of Bailey et al. ('Bailey'

hereinafter) (Patent Number 6,473,767).

As per claim 32, Dada teaches

A system for performing a consistency check of a source ... replicated to a

destination ... by comparing entries in the source and destination ..., the system

comprising: (see abstract)

a process adapted to compare entries in the source ... with entries in the

destination ... by walking the source and destination ... only once, whereby utilization of

storage subsystems associated with the source and destination ... is limited by only

walking each of the source and destination ... once. (paragraphs [0022]-[0028])

Dada does not explicitly indicate "directories".

However, Bailey discloses "directories" (column 3, lines 6-27).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to combine Dada and Bailey because using the steps of

"directories" would have given those skilled in the art the tools to improve the invention

by detect parts of a file system that are added or missing. This gives the user the

advantage of having up to date backup information.

As per claim 33, Dada teaches

the process executes on a computer associated with the source. (paragraph

[0030])

Dada does not explicitly indicate "directories".

However, Bailey discloses "directories" (column 3, lines 6-27).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to combine Dada and Bailey because using the steps of

"directories" would have given those skilled in the art the tools to improve the invention

by detect parts of a file system that are added or missing. This gives the user the

advantage of having up to date backup information.

As per claim 34, Dada teaches

the process executes on a computer associated with the destination. (paragraph

[0030])

Dada does not explicitly indicate "directories".

However, Bailey discloses "directories" (column 3, lines 6-27).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to combine Dada and Bailey because using the steps of

"directories" would have given those skilled in the art the tools to improve the invention

by detect parts of a file system that are added or missing. This gives the user the

advantage of having up to date backup information.

As per claim 35, <u>Dada</u> teaches

the process is further adapted to remove matching entries from a hash table,

whereby future look up operations in the hash table are enabled to be performed faster

due to a smaller size of the hash table. (paragraph [0026])

As per claim 36, <u>Dada</u> teaches

A system for performing a consistency check of a source … and a destination …

by comparing entries in the source and destination …, the system comprising: (see

abstract)

a process adapted to select alternating entries from the source and destination

… to be added to a hash table and further adapted to remove matching entries from the

hash table, whereby a size of the hash table is limited to a number of dissimilar entries

of the source and destination. (paragraphs [0022],[0026])

<u>Dada</u> does not explicitly indicate "directories".

However, <u>Bailey</u> discloses "directories" (column 3, lines 6-27).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to combine <u>Dada</u> and <u>Bailey</u> because using the steps of

"directories" would have given those skilled in the art the tools to improve the invention

by detect parts of a file system that are added or missing. This gives the user the

advantage of having up to date backup information.

As per claim 37, Dada teaches

A system for comparing entries in a source ... with entries on a destination ... to

ensure consistency of replicated data between the source and destination ..., the

system comprising: (see abstract)

a computer associated with at least one of the source and destination ..., the

computer comprising a directory comparison process adapted to perform a comparison

of entries in the source and destination ... by walking each ... once and placing entries

in a hash table and further adapted to remove matching entries from a hash table,

whereby computational cost is reduced for future look up operations in the hash table.

(paragraphs [0022],[0026])

Dada does not explicitly indicate "directories".

However, Bailey discloses "directories" (column 3, lines 6-27).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to combine Dada and Bailey because using the steps of

"directories" would have given those skilled in the art the tools to improve the invention

by detect parts of a file system that are added or missing. This gives the user the

advantage of having up to date backup information.

As per claim 38, Dada teaches

the ... comparison process is further adapted to alternate in selecting entries

from the source and destination ... when walking the source and destination.

(paragraphs [0026],[0029])

Dada does not explicitly indicate "directories".

However, Bailey discloses "directories" (column 3, lines 6-27).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to combine Dada and Bailey because using the steps of

"directories" would have given those skilled in the art the tools to improve the invention

by detect parts of a file system that are added or missing. This gives the user the

advantage of having up to date backup information.

Conclusion

11.   The prior art made of record, listed on form PTO-892, and not relied upon is

considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Jay A. Morrison whose telephone number is (571) 272-

7112. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Tim Vo can be reached on (571) 272-3642. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

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Business Center (EBC) at 866-217-9197 (toll-free).

TIM VO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

Jay Morrison   Tim Vo
TC2100   TC2100